

CLAIMS

1. Method for controlling the spatio-temporal uniformity of a pulsed gas laser beam, in which a pulsed electric discharge is brought about in a gas between two electrodes (101, 102) and an X-ray preionisation beam (104) is applied to this gas whose axis is substantially in alignment with that of the discharge, characterised in that a lateral intensification of the electric field is produced in the space between the electrodes in order to stabilise the discharge in time and space, and in that an axial intensification of the X-ray beam is produced in order to compensate for the modifications of the uniformity of the discharge resulting from this lateral intensification of the electric field.

2. Laser for carrying out the method according to claim 1, characterised in that it comprises at least one electrode (101) which is profiled in order to comprise two raised lateral portions (111, 121) which allow the lateral intensification of the electric field to be obtained in this region.

3. Laser according to claim 2, characterised in that the height of the raised lateral portions (111, 121) is substantially in the order of one hundredth of the distance between the two electrodes (101, 102).

4. Laser according to either claim 2 or claim 3, characterised in that the two electrodes (101, 102) are profiled in order to obtain the lateral intensification of the electric field.

5. Laser according to any one of claims 2 to 4, characterised in that it comprises a progressive mask (103) relative to the X-rays in order to progressively attenuate, from the centre of the discharge to the edges thereof, the X-ray preionisation beam applied along an axis which is substantially in alignment with that of the discharge in order to compensate for the lack of uniformity of the discharge resulting from the intensification of the electric field at the edges thereof.

6. Laser according to claim 5, characterised in that the progressive mask (103) is formed by a plate which absorbs the X-rays and whose thickness is reduced progressively from the locations opposite the two raised lateral portions (111, 121) where the absorption of the X-rays is at a maximum as far as a central portion where the absorption is substantially zero.

7. Laser according to either claim 5 or claim 6, characterised in that the progressive nature of the reduction in thickness of the plate (103) which absorbs the X-rays allows the profile of the absorption curve (106) of the X-rays to be adapted to the profile of the variation of the electric field between these two lateral intensifications.

8. Laser according to either claim 5 or claim 6, characterised in that the plate (103) which absorbs the X-rays is reduced in thickness in accordance with two substantially linear ramps (113, 123) which extend from one of the surfaces thereof in the region of the edges of the discharge in order to open at the other surface, with a central hole (133) being defined which corresponds to the maximum transmission.

9. Laser according to any one of claims 2 to 8, characterised in that it is of the excimer type.